A NEW SPECIES OF WETTINIA AND NOTES ON THE GENUS

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ABSTRACT. The genus Wettinia [Poepp. ex] Endl. (Palmae) is compared with Wettinicaryas Burret and the last reduced to a subgenus of the first. A description of the largely S American Wettinia is accompanied by a provisional key to and listing of the 8 species, including the new combinations W. cladopadra (Dugand) Moore & Dransfield and W. pascicularis (Burret) Moore & Dransfield. A new species from Colombia is described as W. castanea Moore & Dransfield.

The genus Wettinia [Poepp. ex] Endl. was described in 1837 from Peruvian material representing W. augusta Poepp. & Endl., a species with unbranched axes in both staminate and pistillate inflorescences. Other species, both with spicate inflorescences—W. hirsuta Burret, W. weberbaueri Burret—and with branched inflorescences—W. maynesis Spruce, W. quinaria (Cook & Doyle) Burret, W. utills Little—have since been added. Cook & Doyle (1913) established the genus Wettinella to accommodate species with branched inflorescences, but so great are the resemblances to Wettinia otherwise that this secregation has not been accepted by others.

The genus is most closely related to Catoblastus H. Wendl. (including Acrostigma Cook & Doyle and Catostigma Cook & Doyle) among the intarteoid palms (Moore 1973b) and shares with it unisexual inflorescences that are usually borne several on the same hypopodium at a node in the axil of the leaf (Fisher & Moore 1977). Wettima and Catoblastus have been united by Boer (1965, 1972), but we are unable to adopt so inclusive a genus. Catoblastus seems amply distinct in the nature of the leaf, in the structure of the inflorescence, in the minutely hairy not villous or prickly carpels, and in the separated, non-prismatic, roughened but not persistently trichomatous fruits.

WETTINIA AND WETTINIICARPUS

Another genus, Wettiniicarpus Burret (1930), has been less well understood. Efforts have been made by the senior author over a period of years to obtain complete series so that descriptions of fruit and fruiting inflorescences might be supplemented by descriptions of staminate and pistillate flowers and inflorescences. In 1976, while working together in the field in Colombia, we were fortunate enough to obtain staminate and pistillate inflorescences of Wettiniicarpus cladospadix Dugand well-developed within the enclosing peduncular bracts and close to anthesis. At the same place, Dransfield located another palm that much resembled Wettinia quinaria in shape of the undivided pinae but that had only a staminate inflorescence in young bud. During a subsequent visit to the locality, Moore found a fruiting individual of the same species. We have studied the materials and present here our joint conclusion that the second palm represents an undescribed species that might otherwise be described as Wettiniicarpus, were we not convinced that Wettiniicarpus does not ment separation from Wettinia.

* L. H. Bailey Hortorium, Cornell University, Ithaca, New York, 14853. ** Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE. Burret considered Wettiniicarpus to be intermediate between Catoblastus and Catostigma on the one hand and Wettiniia on the other, sharing the lack of a style with Catoblastus and Catostigma and longitudinally divided pinnae with Catostigma, while sharing type of perianth, elongate stigmas, and prismatic fruits with Wettinia. Following Burret, Dugand (1951, 1955) elaborated on Wettiniicarpus and described W. cladospadix as a second species (1955), based on differences in the inflorescence and fruit of the two species.

A survey of pistillate flowers and fruits of Wettinia shows the style to be very short and the elongate stigmas often persistent on the fruit in W. hirsuta and W. quinaria, while the style tends to persist as a flattened, hairy structure to 7 mm long without persistent stigmas in W. augusta and W. maynensis. The short style of Wettiniicarpus does not, therefore, serve as a distinguishing feature, nor can the longitudinally divided pinnae serve to separate the genus, for the pinnae of the new species described below are undivided and quite like those of Wettinia. The crowded flowers and crowded. prismatic, hairy or prickly fruits on thickened axes suggest that Wettiniicarpus is best considered to represent one direction in the apparent tendency for reduction of a branched inflorescence to a spicate axis comparable to a similar reduction found in such diverse genera as Geonoma, Chamaedorea. Areca, and Licuala, among others. The branches are numerous but short or almost lacking in the pistillate inflorescence and the similarly short rachillae of staminate flowers are straight rather than coiled in bud as in other species of Wettinia (Pl. 3Ab/Bb), thus Wettiniicarpus may be recognized as a subordinate unit at the subgeneric level. Before a satisfactory monographic treatment of Wettinia is undertaken, more material is desirable so that complete series of inflorescences, flowers, and fruits from several localities may be compared. For the interim, an expanded description of the genus is accompanied by a provisional key to and listing of the species with associated comments.

Wetinia is one of several genera of palms that exhibit a disjunct distribution in South America, with vicatious species on two sides of the Andes (Moore 1973a). It will be seen from the key that the differences between W. maynensis and W. quinaria and between W. maysusta and W. hissuta are such that identification of incomplete material may be difficult when geographical information is lacking. The lower surface of the leaf seems to vary essentially from glabrous to rather densely pilose in populations of all four species, hence the amount of indumentum is not a useful criterion for specific differentiation. When Wettnitacapus is included in Wettnia, its centre of diversity, like that of the phytelephantoid palms, is west of the main ranges of the Andes in the Chocó refugium (see Haffer 1966; Prance 1973).

Wettinia [Poepp. ex] Endl., Gen. Pl. 243 (1837); Poepp. & Endl., Nov. Gen. et Sp. 2;39, pl. 153–154 (1838); Spruce in J. Proc. Linn. Soc. Bot. 3:194 (1859), J. Linn. Soc. Bot. 11:128 (1871); H. Wendl. in Bonplandia 8:106 (1860); Hook. f. in Benth. & Hook. f., Gen. Pl. 3:902 (1883); Drude in Engl. & Prantl, Nat. Pflanzenfam. 2(3):61 (1887); Burret in Notizbl. Bot. Gart. Berlin 10:939 (1930); Macbride, Flora of Peru in Field Mus. Nat. Hist., Bot. Ser. 13, 1:360 (1960); Boer in Mem. New York Bot. Gard. 23:101 (1972). Type species: W. augusta.

Single-stemmed or cespitose, erect, unarmed, monoecious, pleonanthic palms of moderate size, with prickly adventitious prop roots; trunks slender, ringed.

Leaves reduplicately pinnate, spreading; sheath tubular, forming a prominent crownshaft; petiole rounded beneath, narrowly and shallowly channelled above, subterete in cross section; rachis rounded beneath, angled to a central ridge above; pinnae of two sorts, the first sort undivided, elongate, asymmetrically and narrowly elliptical in outline, narrowed to the asymmetrical base and to the praemorsely toothed apex, the lower margin entire or c. \(\frac{2}{2}\) its length, then praemorsely toothed, the upper margin entire c. \(\frac{1}{2}\) its length, then praemorsely toothed, the upper margin entire c. \(\frac{1}{2}\) its length, then praemorsely toothed, and the midrib inserted excentrically at about the lower \(\frac{1}{2}\) of the base, scarcely distinguishable from the numerous prominent yellowish lateral veins, the midrib and veins not parallel but veins divergent to the marginal teeth; or the second sort with pinnae similar but with stouter veins and longitudinally divided to the base into narrow segments arrayed in several planes and praemorsely toothed at the oblique to subacute apex.

Inflorescences infrafoliar, spicate or branched, 3-8(-15) at a node, maturing centrifugally, the central usually pistillate, the lateral usually staminate, or sometimes the inflorescence single by abortion of accessory buds at the node and either staminate or pistillate at maturity; peduncel prominent, nearly as long as rachis; prophyll short, tubular, bicarinate, open at the apex; peduncular bracts several (4-5), the proximal 2 short, tubular, open at the apex, the distal 2-3 cylindrical in bud, acute, enclosing the inflorescence, splitting longitudinally abaxially and becoming cucullate at anthesis, at length caducous or marcescent, the uppermost peduncular bract sometimes small and incompletely encircling the peduncle; bracts subtending branches and flowers reduced to a low collar or not evident; rachis simple or once-branched with few (3-5) elongate branches or with more numerous short branches, branches or spicate axis of staminate inflorescence coiled or straight in bud.

Flowers white or cream-coloured at anthesis, crowded on the thick rachis or on thick branches: staminate flowers crowded in ebracteolate pairs or singly along the rachis or on the branches; sepals 3(-4), briefly connate and adnate to the receptacle at the base and free and narrowly triangular above or free; petals 3(-4), narrowly triangular, straight or hooked at apex, briefly valvate at base; stamens 8-19, filaments short, filiform or subulate, anthers basifixed, erect, elongate, dehiscent by longitudinal slits, bifid at base, often apiculate at apex, the locules minutely pebbled with tannin cells; pistillode lacking (or minute fide Hook. f.): pistillate flowers angled by mutual pressure, usually with 2 adjacent vestigial staminate flowers persistent and most evident on the axis in fruit; sepals 3(-4), imbricate or separated or briefly connate basally, deltoid to elongate-triangular, nearly straight or variously hooked at the apex; petals 3(-4), similar to but usually longer and broader than sepals: staminodes lacking; gynoecium of I(-2) appressed-hairy (or induratetrichomatous?) fertile carpels and (1-)2 abortive carpels, style basal, very short to elongate, glabrous or pubescent, stigmas 3, large, elongate, glabrous, persistent or deciduous in fruit, ovule laterally attached at the base,

Fruits crowded, prismatic, villous with pale hairs from enlarged bases,

sometimes becoming verruculose or verrucose at the apex in age through loss of hairs, or prickly with indurate, straight or uncinate trichomes to 8 mm long; mesocarp granular; endocarp thin: seed ellipsoid to subglobose, sometimes enclosed in a gelatinous mass when fresh; raphe elongate, with arilliform, reticulate branches; hilum basal, rounded; endosperm homogeneous, corneous; embryo basal; germination adjacent-ligular, the seedling with 3-4 bladeless sheaths, first eophyll toothed, undivided or very briefly bifid at the slightly caudate tip.

I. Subgenus Wettiniicarpus (Burret) Moore & Dransfield, comb. nov. Syn.: Wettiniicarpus Burret in Notizbl. Bot. Gart. Berlin 10:937 (1930).

Type species: W. fascicularis.

Inflorescences often or usually solitary at each node by abortion of 2 buds; rachis with numerous short branches crowded with flowers, but the pistillate superficially resembling a spicate axis at anthesis and in fruit; branches of the staminate inflorescence straight, not coiled in bud.

2. Subgenus Wettinia.

Type species: W. augusta.

Syn.: Wettinella Cook & Doyle in Contr. U.S. Nat. Herb. 16:235 (1913).

Type species: W. auinaria.

Inflorescences usually 3-8(-15) at a node, the central usually pistillate, the lateral staminate; rachis unbranched or the branches few (3-5) and elongate, those of the staminate inflorescence coiled in bud.

KEY TO THE SPECIES OF WETTINIA

Inflorescences often or usually solitary at each node by abortion
of 2 buds; rachis with numerous short branches crowded with
flowers, branches of the staminate inflorescence straight, not
coiled in bud (subgenus Wettiniicarpus).

Hinforescences usually 3-8(-15) at a node, the central usually pistillate, the lateral staminate; rachis unbranched and the inflorescence spicate or with few (3-5) elongate branches, the rachis or branches of the staminate inflorescence coiled in bud (subsenus Wettinia).

2 Fruit covered with indurate, straight or uncinate, brown, spinose trichomes; pinnae simple, not longitudinally divided into segments on mature individuals. [Western Colombia] 1. W. castanea

Fruit villous with soft hairs from a thickened, partly hooked base, sometimes becoming glabrate but verruculose or verrucose with bases of hairs at the apex in age; pinnae longitudinally divided into numerous segments on mature individuals

3 Branches of fruiting inflorescence prominent, the longer c, 2·5-3 cm long; fruit scarcely granular-verruculose. [Western Colombia]

 Branches of fruiting inflorescence reduced to broad protuberances; fruit densely verrucose. [Western Colombia] . 3. W. fascicularis

- 5 Staminate flowers with 8-9(-11) stamens; sepals of pistillate flowers \(\frac{1}{2} \) to nearly as long as or longer than the petals; style short in fruit, with usually persistent stigmas; inflorescence axes mostly densely villous. [Western Colombia and Ecuador] . 4. W. quinaria
- + Staminate flowers with (13-)15-18 stamens; sepals of pistillate flowers mostly less than half as long as the petals; style to 7 mm long in fruit, with usually deciduous stigmas; inflorescence axes
- mostly scabridulous. [Eastern Peru and Colombia] . 5. W. maynensis

 Sepals of pistillate flowers 6–10 mm long, 3–3 as long as petals;
 stamens ca. 12. [Eastern Peru] . 6. W. weberbaueri
- + Sepals of pistillate flowers about half as long as petals or less . 7
- 7 Stems mostly cespitose; petals of staminate flowers 12–15 mm
- long; stamens 15-18; styles to 7 mm long in fruit, with usually deciduous stigmas. [Eastern Peru] 7. W. augusta
- Stems single; petals of staminate flowers c. 6-7 mm long; stamens 9-12(-15); styles short in fruit, with usually persistent stigmas. [Western Colombia, eastern Panamá]
 8. W. hirsuta

1. Wettinia castanea Moore & Dransfield, sp. nov. (Plate 2.)

Caulis singulus. Pinnae foliorum indivisae. Rami inflorescentiae numerosi breves recti floribus dense aggregatis. Florum masculorum stamina (16–)18 (-19). Fructus trichomatibus induratis spinosis rectis vel uncinatis ca. 3–8 mm longis dense obtecti.

Single-stemmed; trunk to c. 7 m high, 15 cm in diam., grey-brown, ringed, with prickly brown stilt roots 0.45-1 m high, 5 cm in diam. in a close cone at base

Leaves 5, spreading; sheath 1-1'5 m long, green, with exceedingly irritant dark brown-black hairs; petiole to c. 25 cm long, densely yellowish-villous when young; rachis densely pilose above and beneath when young except a glabrous dark patch at base of each pinna, c. 2'3 m long; pinnae not longitudinally divided, 33-35 on each side in one plane, more or less opposite, pendulous at tip, dull green and puberulent to short-pilose on surface and veins above, at least when young, densely yellowish to orangish-pilose on the surface beneath with bulbous-based hairs, the midrib and lateral veins usually yellowish with appressed hairs, the veins and midrib on medial pinnae c. 17 in total, lowermost pinnae short, c. 8-14 × 0 8 cm, basal pinnae 26-32 × 2'5-4'5 cm, median pinnae 75-85 × 7-9'5 cm, apical pinnae flabellate, c. 34-48 cm long on lower margin, c. 36-40 cm across top

Inflorescences globose in bud, usually 3 at a node in early stages but often only 1 maturing: staminate inflorescence seen only in young bud, with numerous straight branches 2:5-5 cm long: fruiting inflorescence with decurved peduncle 35 cm long; rachis 35 cm long, with numerous branches to c. 6 cm long; prophyll c. 15 cm long; peduncular bracts 5, pale great, at first covered with irritant brown-black hairs, glabrescent where exposed in age, the first 2 tubular, open at agex, bicarinate, to more than 18 cm long, upper 3 bracts enclosing the inflorescence until anthesis, 36-40 cm long.

Staminate flowers (immature) with deltoid sepals 0.5-1 mm long and broad-ovate petals about as wide as long, c. 1.5 mm long; stamens (16-)18 (1-9): pistillate flowers not seen; perianth in fruit strongly nerved, brown-pilose; sepals triangular (1-)5-6 × 3.0-3.5 mm, usually less than half as long

as petals; petals narrowly triangular to triangular, 7-12 × 3.5-7 mm, brown-pilose; style scarcely evident in fruit, stigmas glabrous.

Fruits angled by mutual pressure, c. 3.5 cm long, 1.5-3 cm across the tip, covered with indurate, brown, straight or uncinate, spinose trichomes 3-8 mm long: seed incompletely formed.

COLOMBIA. Department Chocó: wet slopes 8:6-8:8 km below crest of Cordillera Occidental (at boundary of Departments del Valle and Chocó), on road from Cartago to San José del Palmar, c. 1700 m, 2 iv 1976, J. Dransfield, H. E. Moore, Jr., & V. M. Patiño 48:55 (BH, COL, K), same locality, 9 xii 1976, H. E. Moore, Jr. & V. M. Patiño 10311 (BH, holotype; COL, K, isotypes).

The epithet for this unusual species is the generic name Castanea used naposition because of the superficial resemblance of the clusters of mature fruits to the burr of a chestnut (Plate 2C). When first discovered, only an individual with a young staminate inflorescence was found and the generic status was not certain. Eight months later, trees were in immature fruit and were clearly assignable to Wetthia in our broader concept of the genus. The inflorescence obtained (Plate 2A) weighed 17:27 kg.

Wettinia castanea grows with W. cladospadix, from which it is immediately distinguishable vegetatively by the graceful leaves with undivided pinnae and in fruit by the indurate trichomes rather than villous hairs on the individual fruits.

Wettinia cladospadix (Dugand) Moore & Dransfield, comb. nov. (Plate 3A.)
 Syn.: Wettiniicarpus cladospadix Dugand in Caldasia 7, 32:138 (1955).
 W. fascicularis sensu Dugand in Revista Acad. Colomb. Ci. Exact. 8:302 (1951). non Burret (1930).

Type: Colombia, Dept. del Valle, Quebrada de San Juan, abajo de Queremal, Cuatrecasas 22732 (COL).

Wettinia cladospadix was confused with W. fascicularis by Dugand in 1951, when a fruiting individual with developing buds (three at a node in a young stage, one in a later stage) was illustrated. Further illustrations of the inflorescence, fruits, and seeds were provided in 1955. The range of the species may now be extended from the type locality in the Department of del Valle to the Department of Chocó, where it occurs with W. castanea (Moore & Dransfield tozgi, BH, COL, K.)

3. Wettinia fascicularis (Burret) Moore & Dransfield, comb. nov.

Syn.: Wettiniicarpus fascicularis Burret in Notizbl. Bot. Gart. Berlin 10:938 (1930).

Type: Colombia, Dept. Antioquia, Pulperia, Kalbreyer 1644 (B, destroyed).

The type of this species was apparently a unicate collection destroyed at Berlin. Dugand (1955) has illustrated a fruiting inflorescence from Antioquia (Daniel 4464) that agrees with Burret's description and has contrasted W. fascicularis with W. cladospadix. Staminate material of W. fascicularis is a desideratum for further understanding differences between the two species.

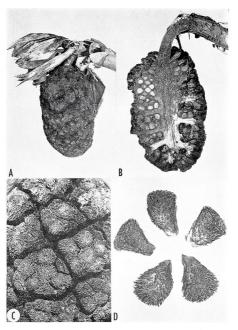


PLATE 2. Wettinia castanea. A, infructescence; B, infructescence split longitudinally; C, surface view of partially dried infructescence showing clusters of fruits at ends of branches; D, individual fruits. Photos by H. Lyon from material of Moore & Patilio 10311.

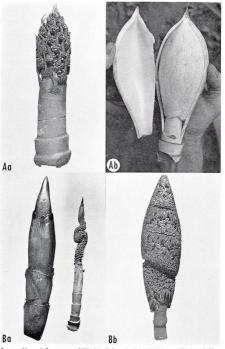


PLATE 3, Young inflorescences of Wettinia Cadaopadix (A) and W. hirsuta (B), Aa, pistillate in early stage with abortive staminate flowers distally; Ab, staminate near anthesis with short, straight rachillae; Ba, pistillate in early stage; Bb, staminate near anthesis with single colled axis. Photos by H. Lyon (Aa, Ba, Bb) and A. B. Anderson (Ab) from material of Moner, Anderson, & Patilio 10026 (A) and Moner, Anderson, Prafer & Mori 1018 (B).



PLATE 4. Inflorescences of Wettinia hirsuta (A) and W. quinaria (B). Aa, portion of trunk with four nodes bearing inflorescences at various stages from but to mature fruit, only pistillate inflorescences remaining at three nodes; Ab, portion of trunk with staminate inflorescence expanding (centre) and infructescence from another node (right); B, inflorescences at several nodes in various stages of maturity, one staminate, recently expanded with axes uncoiled. Photos by A. B. Anderson (A) and M. V. Parthasarathy (B) from material of Moore, Anderson, Dressler & Mori 1038 (A) and Moore & Parthasarathy (938 (B)).

4. Wettinia quinaria (Cook & Doyle) Burret in Notizbl. Bot. Gart. Berlin 10:942 (1930); Dugand in Caldasia 7, 32:134 (1955). (Plate 4B).

Syn.: Wettinella quinaria Cook & Doyle in Contr. U.S. Nat. Herb. 16:236, pl. 54B (corrected) [54A (as Acrostigma equale) uncorrected],

56C(?), 59B, 63B, 64, 65 (1913).

Wettinia utilis Little in Phytologia 19:251, fig. 17 (1970). Type: Ecuador, Esmeraldas, Alto Tambo, Little & Dixon 21114 (US). Type: Colombia, del Valle [Cauca], Cordoba, C. B. Doyle s.n. (US).

Plate 54 accompanying Cook & Doyle's description of Wettinella quinaria was originally issued with the figures preversed but a corrected plate was later provided with the figure appropriately associated with the legend as Plate 54B. The leaf in this plate and the apex in Plate 64 are uncharacteristic in that the apex appears to be deeply divided, normally the apex of the leaf of Wettinia quinaria is flabellate and only very briefly bifid at the centre except where damaged by the action of wind or other forces. There is also the possibility that the figures in Plate 56A and C are reversed.

Comparison of an isotype (BH) of W. utilis with other collections from Colombia and Ecuador does not reveal differences that appear significant.

Wettinia maynensis Spruce in J. Proc. Linn. Soc., Bot. 3:194 (1859), J. Linn. Soc. Bot. 11:130 (1871); Burret in Notizbl. Bot. Gart. Berlin 10:942 (1930); Dugand in Revista Acad. Colomb. Ci. Exact. 8:392 (1951); Maebride, Flora of Peru in Field Mus. Nat. Hist., Bot. Ser. 13, 1:361 (1960).

Syn.: Wettinia illaqueans Spruce in J. Proc. Linn. Soc., Bot. 3:191 (1859), nomen nudum.

Catoblastus maynensis (Spruce) Drude in Mart., Fl. Bras. 3, 2:544 (1882).

Wettinella maynensis (Spruce) Cook & Doyle in Contr. U.S. Nat. Herb. 16:237 (1913).

Type: Peru, in convallibus Andium Maynensium umbrosis, Spruce, Hb. Palm. 59 (K).

Wettinia weberbaueri Burret in Notizbl. Bot. Gart. Berlin 10:939 (1930);
 Macbride, Flora of Peru in Field Mus. Nat. Hist., Bot. Ser. 13, 1:361 (1960).
 Type: Peru, Prov. Sandia, Chunchusmayo, Weberbauer s.n. (B, destroyed).

No material of W. weberbaueri has been seen. It is therefore maintained on the basis of the difference in perianth noted by Burret; the length of stamens relative to petals, also used as a distinguishing feature, may well be a function of the stage of maturity.

7. Wettinia augusta Poepp. & Endl., Nov. Gen. et Sp. 2:39, pl. 153-154 (1838). Caudichaud, Voyage Bonitie pl. 15 (1851); Wendland in Bonplandia 8:106 (1860); Spruce in J. Proc. Linn. Soc., Bot. 3:194 (1859). J. Linn. Soc. Bot. 11:130 (1871); Burret in Notizbl. Bot. Gart. Berlin 10:393 (1930); Dahlgren, Index to American palms, plates in Field Mus. Nat. Hist., Bot. Ser. 14; Pl. 412 (1959); Macbride, Flora of Peru in Field Mus. Nat. Hist., Bot. Ser. 14, 1:360 (1960).

Syn.: Wettinia poeppigii Kunth, Enum. Pl. 3:109 (1841). Type: as below. Type: Peru, Tocache, Poeppig 2058 (W, destroyed, photo, Field Mus. neg. 29887).

8. Wettinia hirsuta Burret in Notizbl. Bot. Gart. Berlin 10:941 (1930). Type: Colombia, Dept. Antioquia, Canoas, Kalbreyer 1412 (B, destroyed). (Plate 2B, 3A)

Although the type was apparently a unicate destroyed at Berlin, recent collections from eastern Panamá (Correa & Dressler 982, MO; Duke 8025, MO; Moore, Anderson, Dressler, & Mori 10187, BH; Mori & Kallunki 3687, BH) appear to agree with Burret's species and are so identified.

EXCLUDED SPECIES

The two names noted below were not validly published under provisions of the International Code of Botanical Nomenclature because no basionym was provided.

Wettinia mesocarpa (Burret) W. Boer in Acta Bot. Venez. 6:307 (1972), nomen=Catoblastus mesocarpus Burret.

Wettinia praemorsa (Willd.) W. Boer, l.c., nomen=Catoblastus praemorsus (Willd.) H. Wendl.

ACKNOWLEDGMENTS

We are indebted to authorities of the Smithsonian Tropical Research Institute for field facilities at Cali and to Dr V. M. Patiño for advice and companionship in the field. Mary K. Hausmann prepared the plates and Lucille Herbert typed the manuscript. This work was supported in part by National Science Foundation Grant DEB 73-06854 Adv to the senior author.

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